

# Bat predation by the Yellow Snake or Jamaican Boa, *Epicrates subflavus*.

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*During field studies of the aquatic fauna in the water filled leaf axils of wild pine (bromeliads) in the Cockpit Country, we had several possibilities to visit Windsor cave, home of a huge bat population consisting of several thousands of individuals.*

These bats leave the cave in the evening in an impressive mass exodus via a small side exit of the cave. This exit is shaped like a funnel, a narrow passage from the bat's resting place inside the cave leading into a huge cavern of about 25 by 10 m, with stalactites and vines hanging down from its ceiling. After sunset the bats pour out by this hole by the thousands, filling the air with silent shadows. The bats fly close to the ceiling, some more or less straight to the upper rim of the funnel and out and above the forest trees, but some circle the cavern's opening for a while before heading out.

In March 1994 we were able to watch this spectacle several times. On these occasions we noticed a intermediate sized Jamaican Boa (*Epicrates subflavus*, ca. 1.8 m long) creeping out on one of the vines along the ceiling and half way down into the cavern, settling just about 20 m from the entrance well before bats began to fly. Just after dawn, when the first bats started to pour out of the hole, the boa changed position: It coiled its tail around the vine and hang down two thirds of its body, with slightly lifted head. As soon as the bat-stream intensified, the boa started to give its body an S-shape, now and then releasing tension in sudden strikes into the air with wide open mouth (Fig 1). The bats, which passed often very close to the open fangs, showed no evident reaction to this predator.

The boa was obviously snapping for bats, though it seems unlikely that the bat's echolocation should fail at such a distinct obstacle. But during our observations no successful strike was observed, though the boa was actively chasing for about 1 h per night at the same place in three out of four nights. Twice a second and smaller boa (ca. 1.2 meter) of the same species displayed a similar behaviour about 15 meters off the other snake. Usually the boas crawled into position at about 17.00 h and started preying 60 minutes later. The strikes followed each other at a sequence of 30-60 sec., increasing with higher bat densities to a sequence of about 5-10 sec. We had the impression that the snakes did not go for individual bats, but struck rather undirected. They stopped striking at 19.00 h, when bat flying had decreased considerably. The snakes still held their position when we left the site at about 21.00 h.

Before sunrise, when the bats returned to their roosting places inside the cave, the boas were always absent: In contrast to the relatively slow and undirected flight of the bats in the evening, homing bats fell down into the opening like stones and remained close to the bottom of the cave, with distinct hissing flight sounds due to their high speed, keeping the bats well off the site the snakes used to lurk for them in the evening.

We did not catch the boas for stomach analysis, however, our observations strongly suggest that they were indeed



Yellow Snake attacking bat.

Photo by Ekkhard Vareschi

using a sit-and-wait foraging strategy, striking at flying bats, and that this is a regular behaviour for these individuals and probably for the Jamaican Boa in general.

Diesel (1992) reported several sightings of snakes in the Windsor area, including the Yellow Snake, Thundersnake (*Tropidophis haetianus*), Two-headed Snake or Jamaican Typhlops (*Typhlops jamaicensis*) and Black Snake (*Arrhyton funereum*). However, the peculiar bat-preying behaviour described above was not observed.

We found only few references in the literature, mentioning bat predation as a feeding strategy of boas on Caribbean Islands. Hardy (1957) reported a correlation between bat and snake activity in evening hours in a Cuban cave; bat predation was confirmed for *Epicrates angulifer*. These observations lead to the suggestion that snakes strike at bats as they fly through constricted openings or catch them when roosting in accessible areas.

Puerto Rican Boas (*Epicrates inornatus*) were observed resting among aerial roots, on rock ledges, or hidden in crevices during day and becoming active at dusk as the first bats emerge from caves. They crawled in a position where they were able to suspend into the flight path. Bats were killed by constriction before swallowing them head first (Rodriguez & Reagan 1984).

Similar observations are given by Arendt & Anthony (1986) for the St. Lucian Boa (*Boa constrictor orophias*) feeding on bats in roost in a large tree cavity. The boa was

positioned at the entrance as daylight began to fade. In response the bats moved higher up within their roost. the boa caught bats as it was climbing up higher within the inner wall of the cavity.

Four boa species have been observed preying for bats, in three cases preying for bats in flight. To our knowledge all published observations are from Caribbean Islands, but Kalko (pers.comm.) mentioned similar observations from Bajo Colorado Island (Panama). This suggests that predation for flying bats might be a common feeding strategy of boas.

We do hope that further observations at Windsor Cave and other relevant sites will reveal more details about the behaviour we observed, especially with data on effort and success of this strategy.



Arendt, W.J. & Anthony, D. 1986. Bat predation by the St. Lucia Boa (*Boa constrictor orophias*). *Carib. J. Sci.* 22: 219-220.

Diesel, R. 1992. Snakes of the Cockpit Country. *Jamaica Naturalist* 2: 29-30.

Hardy, J.D. 1957. Bat predation by the Cuban Boa, *Epicrates angulifer* Bibron. *Copeia* 2: 151-152.

Rodriguez, G.A. & Reagan, D.P. 1984. Bat predation by the Puerto Rican Boa, *Epicrates inornatus*.